obituary

Benjamin Lee

PROFESSOR BENJAMIN W. LEE died in an automobile accident on 16 June 1977. Director of Theoretical Physics at Fermi National Accelerator Laboratory and Professor of Physics at the University of Chicago Enrico Fermi Institute, Ben Lee was at the age of 42 deeply engaged in scientific activity at the forefront of high energy physics.

Born in Seoul, Korea, Ben Lee emigrated to the United States in 1956 and obtained citizenship in 1968. He studied at Miami University (Oxford, Ohio), the University of Pittsburgh and the University of Pennsylvania, where he was awarded a doctorate in 1960. His earliest work dealt primarily with dispersion relations and related techniques in the analysis of strong interaction phenomena, but he also had an early interest in Lagrangian symmetries and spontaneous symmetry breakdown, which ultimately became the focal points of his research.

By 1964 Ben Lee was a leading contributor to the study of the transformation properties of weak interactions with respect to strong interaction symmetries, and the intimately related question of the full symmetry properties of the strong interactions themselves. Through such studies the relevance of a spontaneously broken chiral symmetry gradually became apparent, and Lee contributed significantly to the construction and study of Lagrangian field theories which realise this property. His work demonstrating the renormalisability of these theories provided an encouraging model for later developments which led in 1971 to the establishment of renormalisability of spontaneously broken gauge theories. Following this breakthrough, Lee's work on the formal demonstration of renormalisability of gauge theories and on the elaboration of calculation techniques was of major importance in the further development of this field which has taken a dominant position in our present thinking.

As soon as the relevance of gauge theories for weak interactions began to appear highly probable, Ben Lee turned to the study of their practical implications, both for the newly discovered neutral current interactions and for the previously established properties of charged current interactions.

The use of new theoretical developments allowed a confrontation with experiment which placed severe restrictions on the possible choice of gauge models. It became increasingly clear that a viable model should incorporate charmed particles which had been postulated before achievements in renormalisation made such an inference compelling. Lee devoted considerable study to the expected properties of these particles and the possibilities for their experimental detection.

Along with the experimental discovery of charm, there has been a continuous experimental and theoretical evolution in the field of both weak and strong gauge theories, in which Ben Lee continued to participate fully. His rare combination of a familiarity with formal mathematical techniques and a close touch with experimenters and experimental results kept him at the forefront of many different aspects of these developments. At the same time he continued to reflect on the outstanding problems related to his earlier work on weak interaction symmetries and was quick to apply new developments to the clarification of old problems. He encouraged precision experiments designed to resolve long-standing questions as well as pioneering experimentation on the new phenomena.

Ben Lee's decision to remain permanently as head of the Fermilab theory group was not an easy one for him. He felt that at a university he would be freer to pursue fundamental theoretical questions. Yet while continuing to participate in the fast pace of theoretical research, he took extremely seriously the responsibilities of his position at Fermilab. On the one hand he attracted theoretical physicists of the highest quality as visitors to the laboratory and was in the process of putting together a small but strong nucleus of resident theorists. On the other hand he was deeply involved in laboratory policy concerning its present and future experimental programme, a job which he undertook with singular conscientiousness, endeavouring to learn the fine points of experimental techniques.

Before joining the Fermilab staff in 1973, Benjamin Lee was Professor of Physics at the State University of New York at Stony Brook. In addition to his responsibilities at Fermilab he served on the scientific policy com-

mittees for several major laboratories. He was the recipient of a number of prestigious scientific fellowships and had held appointments at many institutions in the United States and abroad. Perhaps his most meaningful experience in recent years was a visit to his native Korea where he was struck by the developing prospects for scientific research and found himself "working six days a week on upgrading graduate education in basic sciences" at the Seoul National University.

Ben Lee shared a close family life with his wife Marianne and teen-aged son and daughter at their home in Glen Ellyn, Illinois. Whenever possible they combined business with pleasure on trips to Aspen in Colorado, Europe and the Far East. An immeasurable personal tragedy for his family, Benjamin Lee's untimely death is a deep loss for the entire high energy physics community.

Mary K. Gaillard

Fred Hardy

PROFESSOR FRED HARDY, CBE, who died at St Augustine, Trinidad, in May at the age of 88 was the doyen of British tropical soil scientists. During his professional life the study of the soil developed from a subject that had little impact on practical agriculture to a discipline that has made major contributions to agricultural development, and Professor Hardy played a notable role in this transformation for tropical soil studies.

Almost his whole adult life was spent in the West Indies and Central America. His first appointment after leaving Cambridge University, was as lecturer in natural and agricultural sciences at Harrison College, Barbados, in 1911. He returned to England in 1917 towards the end of the First World War, then after the war spent a year at the School of Agriculture at Cambridge and then went back in 1920 to the West Indies as soil chemist with the Imperial Department of Agriculture, which was centred at St Augustine. This later became the Imperial College of Tropical Agriculture, and he became its first Professor of Chemistry and Soil Science. After his retirement in 1956 he served as Professor of Soil Science in the Inter-American Institute of Agricultural Sciences at Turrialba, Costa

Rica, for nine years before finally retiring to Trinidad.

Hardy's research career began after his return to the West Indies in 1920. He began by being interested in problems of soil water and the effect of water on some soil properties; then in the 1930s he became interested in the characteristics and genesis of tropical soils and laterites; and finally in the 1940s and 1950s he developed his well known studies on the soil factors that affect the fertility of tropical soils and their suitability for specific crops. In addition he was one of the early British soil scientists who realised the need for appropriate soil surveys for agricultural development, and I believe the first in the colonial Empire to institute a systematic soil survey, and he succeeded obtaining funds over a period of years for a survey of most of the British West Indies.

Professor Hardy had, however, a far greater influence on British colonial agriculture than would be judged from his research work, for almost every recruit to the Colonial Agricultural Service since the mid-1920s spent a year in Trinidad and most would study soils under him. His enthusiasm, his great friendliness and approachability, and his gift for picking out the most important points in any discussion, all left their mark; and his appreciation of the relation of the soil and the crop to the natural landscape must have influenced the ecological approach to agricultural development shown by many outstanding colonial agricultural officers.

E. W. Russell

William Parker

THE sudden and untimely death of William Parker, Professor of Chemistry at the University of Stirling, at his home in Dunblane on May 9 at the age of 45, has left the world-wide chemistry community with an immense feeling of loss.

Born in Glasgow in 1932, Willie Parker was a distinguished pupil of Whitehill Secondary School after which he went to the University of Glasgow where he took a first class honours degree in Chemistry in 1953. He started his PhD studies in Glasgow with Professor R. A. Raphael and completed them at the Queen's University of Belfast when Raphael moved there to his first professorial post. In 1956 Willie joined Professor G. Stork's group at Columbia University and then returned to the University of Glasgow where he rapidly moved up the academic ladder, culminating in his appointment to a senior lectureship in 1966. Promotion to readership saw him back in Ireland in 1968 at the

New University of Ulster where he spent two happy years helping to build up the new chemistry department there with characteristic drive and enthusiasm under the leadership of Professor M. Grundon. Armed with this valuable experience he returned to Scotland in 1970 to take up the first chair in organic chemistry at the University of Stirling.

Natural products, particularly the sesquiterpenes, were Willie's first love and in this area he published many important papers relating to their synthesis, biogenesis and rearrangements. In particular, he and his co-workers unravelled many of the problems associated with the molecular acrobatics of caryophyllene and humulene and their derivatives. Although he maintained this interest throughout his research career, a sabbatical year with Professor J. Berson at the University of Wisconsin in 1965 served to promote and nurture his growing interest in organic reaction mechanisms with particular emphasis on the solvolytic behaviour and preferred conformation of a wide range of bridged bicyclic compounds. Of particular note were his contributions to the understanding of the reactivity of bicyclo[3,3,1]nonane, bicyclo[3,3,2]decane and bicyclo[3,3,3]undecane (manxane) derivatives. At the other end of the spectrum he also had a keen research interest in the chemical factors influencing germination and dormancy in wild oat seeds. Shortly before his death, his group, together with collaborators in other disciplines, had made significant advances in this area.

Over the past eighteen years I knew him in many different rôles; as a teacher, as a research supervisor, as a colleague, as an opponent on the squash court and, above all, as a friend. In all these aspects his boundless enthusiasm, inexhaustible drive, unadulterated Glasgow humour, and extrovert personality made a tremendous impact on me as they did on so many other people. If ever there was a teacher who practised the subtle art of instilling a sense of dedication and professionalism in his students there was no greater practitioner than Willie Parker. Under his guidance and tuition organic chemistry came across as an exciting and challenging field of study.

Over the years many students, of whom I was one, continued their studies with Willie as their PhD supervisor. He shared in our triumphs and disappointments at the bench, our laughter and our tears. All of us greatly benefited from that experience and I have no doubt that his guiding principles and aspirations had a profound influence on us.

His rumbustious character came

through vividly in all the many facets of his work at the University. Willie was by no means an isolationist in an ivory tower; he enjoyed all his teaching commitments whether in the first year undergraduate laboratory with his sleeves rolled up or at the Monday evening postgraduate seminars. He approached his administrative duties both in the chemistry department and in the many university committees on which he served with a refreshing, down-to-earth attitude.

More than anything else he wanted to and did put the Chemistry Department of Stirling University on the map. I believe that he achieved this not only by his own personal reputation in the world of organic chemistry and by his service on national committees such as the Chemistry Panel of the Science Research Council, but also by his active encouragement of other members of staff to apply for grants and to seek and establish links with the chemical industry. Above all he had the unique ability to muster and channel our individual energies towards the common cause of creating a resourceful and stimulating department. His door was always open to those seeking advice and counsel. It is not surprising that he achieved so much during his relatively short trip to India last year while acting as project co-ordinator for a UNDP/UNESCO programme 'Special Assistance to Selected Science Departments in Indian Universities.' The United Nations could not have picked a better man for such a stamina-sapping mission.

Willie's tough professionalism really knew no boundaries; it overspilled onto many other areas including the sports field. His light blue tracksuit is a legend at Stirling University. Even beyond the campus his zest and vigour were manifest. At various times he was chairman of the local gardening club, a member of the male voice choir, and a coach to one of the Cub football teams. Just as Willie knew how to advise and encourage young academics, so too did he help the nine-year-old footballer. From his own student days as a keen footballer he remembered the importance of a new strip and the morale-boosting sing-song in the car returning from a 26-nil defeat.

All his many friends, both in the UK and abroad, have shared in one unique privilege—that of knowing the truly remarkable character of Willie Parker. For all of us, we are the beneficiaries of that enriching and rewarding experience, the memory of which will live on to compensate in part for our tragic loss which we share with his wife and three children.

James S. Roberts